Naomi Siphon Sediment Enrichment

Coast 2050 Strategies:

Coast wide: Dedicated dredging for wetland creation.
Regional: 6. Enrich existing diversions with sediment

Project Location: The project is located in Coast 2050 Region 2, Barataria, Basin, Plaquemines Parish, at Naomi, LA, along the western bank of the Mississippi River.

Problem: The wetland area west of Naomi, has been converting rapidly to open water over the last three decades. Prior to construction of the existing siphon, wetland loss rates have been as high as 1.38% /yr. The primary cause of these losses is almost certainly an accretion deficit, relative to Relative Sea Level Rise (dominated by subsidence) in turn caused by the elimination of input of inorganic sediment from overbank-flooding of the Mississippi River, in turn caused by the leveeing of the Mississippi River. Other causes include reduction of accretion due to reduction of inorganic sediment input due to altered hydrology caused by spoil banks along oil and gas pipeline and access canals. Reduction of flows through the wetlands due to semi-impoundment by the spoil banks may also have increased water levels and reduced flows through the marshes, which may have had the effect of reducing plant health and productivity, which could have both direct negative impacts on marsh vegetation, potentially resulting ultimately in conversion to open water, and indirect negative effects, through reduction of accretion via organic matter production by plants. In addition, saltwater intrusion and increased tidal flows may have resulted in the conversion of fresh marsh to open water.

Proposed Solution: The proposed project involves using a dedicated dredge during high water levels in the Mississippi River, to pump fine-grained river-bottom sediment into the discharge stream of the siphon. The enriched effluent would build a small delta in the marsh, near its juncture with the receiving marsh, and would continue its course overland and through the wetland/water system, depositing fine-grained sediments along its route. The project would consist of a dedicated dredging and pumping system to transport sediments from the bottom of the Mississippi River to the effluent discharge of the existing Naomi siphon. The project would include the construction of a mooring structure in the Mississippi River. A fixed pipeline would be installed from this structure and terminate at a location either within the existing outfall canal or just outside the canal, at the primary point of discharge from the canal into the wetland system. The pipeline would only be designed to terminate within the existing outfall canal if it can be demonstrated that water in the canal has sufficient flow to move an appropriate quantity of sediment out of the canal and into the marsh system. Otherwise, the pipeline would be designed to terminate just past the juncture of the canal and the receiving marsh. The pipeline installation would parallel the existing siphon pipes and be constructed in a manner that would permit future extensions. Enrichment would continue for 20 yrs.

Preliminary Project Benefits: Approximately 2,000 acres of productive wetland area would be provided with a source of fine sediments that would result in accretion of new wetlands in some of the existing open water areas (400 ac), as well as reduced rates of accretion in much of the existing marsh acreage offsetting future subsidence (1.1-1.29 cm/yr not counting existing siphon benefits), and helping to maintain wetland plant health and productivity. These preliminary benefit estimates are contingent upon the ability to move the required volumes of sediment using the existing flows provided by the siphon, which on first-analysis appears reasonable. However, if upon detailed analysis, it is determined that our estimates of ability to transport sediments as proposed using the existing siphon flows are too high, then benefits and costs (dredging) will have to be reduced. These sediments would also supply additional nutrients that could stimulate plant productivity. It is estimated the combined effects of the existing siphon, outfall management, and this proposed project, would completely offset Relative Sea Level Rise and the attendant future wetland losses here. Implementation of this project would provide enhanced protection to the back levees of Plaquemines Parish, and would serve to mitigate storm surge effects in the area.

Compatibility with Coast 2050 Criteria

Wetland Elevation/Sustainability

The project sustains 250-500 acres of emergent wetlands acres over the project life.

Ecosystem Influence Area

The project beneficially influences 1,000-3,000 acres.

Structural Framework

The project has no effect on structural components of the coastal ecosystem.

Infrastructure

The project implementation will have a moderate net positive impact on critical infrastructure.

Organism and Material Linkages

The project is expected to allow a natural level of organism and materials exchange, consistent with the sustainability of the ecosystem.

Coast 2050 Habitat Objectives

The project has no effect on the Coast 2050 habitat objective.

Project Synergy

The proposed project provides a high degree of synergy with the Niomi Siphon project

Identification of Potential Issues: Pipelines/utilities; O&M=high

Preliminary Construction Cost: $10-15 million

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